



Green Infrastructure & Stormwater Management CASE STUDY

North Carolina Botanical Garden Visitor Education Center

Location: Chapel Hill, NC

Client: North Carolina Botanical Garden

Design Firm(s): Swanson and Associates, P.A., and Howard Partner Landscape Architecture/Stormworks

Landscape architect/Project contact: David Swanson, ASLA, Swanson and Associates, P.A., and Howard Partner, Stormworks

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ASLA Chapter: North Carolina

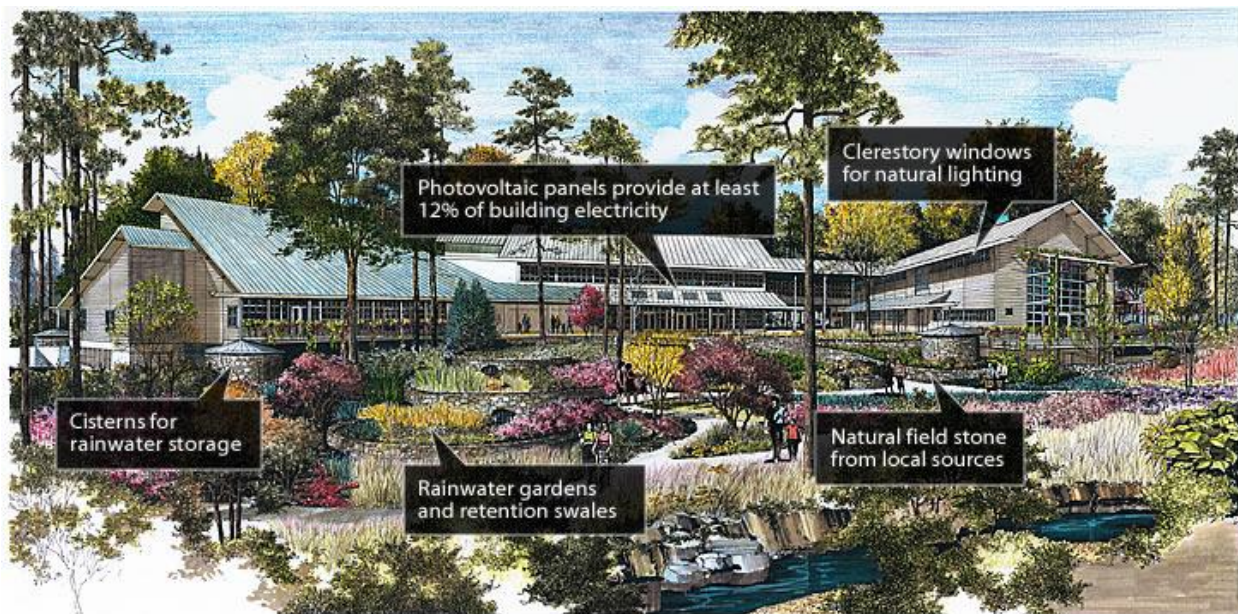


Photo: North Carolina Botanical Garden

Project Specifications

Project Description: This site development for the project focused on preserving green spaces by redeveloping existing developed areas, removing existing impervious surfaces where possible, and employing these primary design techniques -- bioretention and bioswales, porous paving, and rooftop rainwater capture by cisterns -- for newly developed areas in order to match the stormwater runoff characteristics of the pre-development site conditions.

Project Type:

Institutional/educational and garden/arboretum
Part of a redevelopment project

Design features: Bioretention facility, rain garden, bioswale, cistern, porous pavers, curb cuts, and removal of existing impervious surface asphalt.

This project was designed to meet the following specific requirements or mandates:

State statute, local ordinance, to meet funding criteria, developer/client preference, LEED Platinum Level

Impervious area managed: 1 acre to 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: greater than 5 acres

The regulatory environment and regulator was supportive of the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? Yes: energy savings, usable green space, and building energy.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$500,000-\$1,000,000 (Public funding: None - these were private contributions for a public project)

Related Information: Permeable paving parking: \$425,000, including material and labor for installation, over-excavating unsuitable soils, and providing gravel storage areas. Bioretention basins: 8 x \$30,000 each = \$240,000 Bioswales and vegetative filters: \$40,000 Cisterns and rainwater harvesting: \$190,000

Was a green vs. grey cost analysis performed? Yes, a LEED cost benefit analysis is available. A stormwater analysis was also performed.

Cost impact of conserving green/open space to the overall costs of the site

design/development project: Because of town and university requirements that runoff and peak discharge not exceed pre-development conditions, and a further requirement for pollution abatement for runoff from developed areas, minimizing the developed areas by preserving green spaces mitigated the need for special stormwater controls, reducing costs. Additionally, as a public botanical garden, preserving green spaces adds to the intrinsic value of the entire project.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Slightly increased.

Number of jobs created: 25

Job hours devoted to project:

Planning and Design: more than 800 hours (7-year planning/design endeavor)

Construction: 2 year construction buildout

Annual Maintenance: 100 hours

Performance Measures

Stormwater reduction performance analysis:

Following are percentages of stormwater retained on site for existing and developed conditions. Numbers are for entire Botanical Garden site. 1-year storm - existing 63%, developed 63% 2-year storm - existing 56%, developed 55% 10-year storm - existing 44%, developed 44% 100-year storm - existing 33%, developed 33%

Community & economic benefits that have resulted from the project: Economic benefits for public institutions are indirect. However, other benefits included protection of water quality, educational benefits, and providing a model for green development for the community.

Project Recognition

LEED Platinum Level

Additional Information

Links to images: <http://www.ncbg.unc.edu/pages/4/>
<http://www.frankharmon.com/current/11/>



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